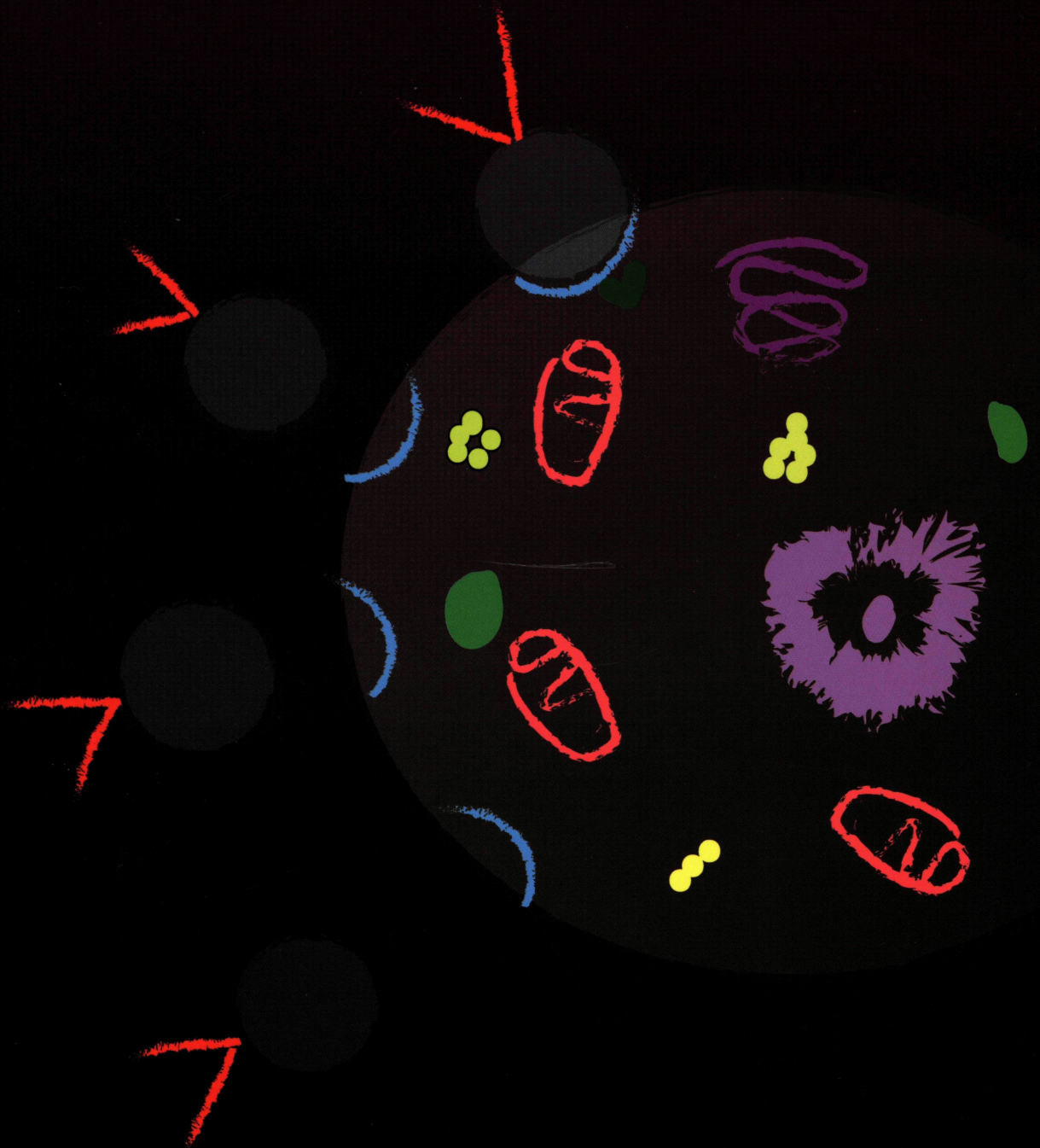


Volume 1 | 2015

COMPENDIUM OF
ORAL SCIENCE

The Official Journal of The Faculty of Dentistry



UNIVERSITI
TEKNOLOGI
MARA

ISSN 2489-1102

COMPENDIUM OF ORAL SCIENCE

The Official Journal of The Faculty of Dentistry

Volume 1|2015

ISSN: 2489-1102

Editorial Board

Editor-in-Chief

Kazi Ahsan Jamil

Editorial Board

Profesor Dr. Fouad Hussain M H Al-Bayaty

Assoc. Professor Dr. Norashikin Yusof

Dr. Nagham Mohammed Abdullah

Dr. Nik Mohd Mazuan Nik Mohd Rosdy

Dr. Alaa Sabah Hussein

Dr. Eddy Hasrul bin Hassan

Dr. Faezah Sabirin

Editorial Office

Mr. Abdullah Yusoff

Mrs. Maskiah Abdullah

Honorable Advisor to Editorial Board

Professor Dr. Mohamed Ibrahim Abu Hassan

Graphic Design

Mrs. Rubiah Mohd Yusoff

Editorial Address

Kazi Ahsan Jamil, BDS, PhD

Editor-in-Chief,

Compendium of Oral Science (Compend.Oral.Sci),
Faculty of Dentistry

UiTM Sungai Buloh Campus

Jalan Hospital,

47000 Sungai Buloh,

Selangor, Malaysia.

Tel: +603-6126 6511

Fax: +603-6126 6103

E-mail: kazi@salam.uitm.edu.my

Copyright © 2014 by Faculty of Dentistry, Universiti Teknologi MARA (UiTM). All rights reserved. Materials contained in the journal may be reproduced for educational purposes provided that both the author(s) and the editorial office are appropriately recognized; otherwise duplication is not permitted. No articles, reports, or portions there of may be translated into other languages, published in books, journals, magazines, or any other print form without written permission from the editor-in-chief.

Disclaimer: The statements, opinions and data expressed in the articles and reports herein are those of the author(s) and not of the publisher and the editor(s). The publisher and the editor(s) disclaim responsibility for any injury to persons or property resulting from any schemes, methods, instructions or ideas referred to in the content.

Contents

ORIGINAL ARTICLE

Digitalized Bite Mark Analysis for the Undergraduate Dental Students <i>Mohd Yusmialdil Putera Mohd Yusof</i>	1
Feasibility of Using Latex Examination Gloves as Dental Dam: A Tensile Strength Study <i>Budi Aslinie Md Sabri, Nur Hidayah Mohd Radzi, Fatimatuz Zahira Abdul Hadi, Ikmal Hisham Ismail</i>	6
Assessment of Interradicular Spaces for Miniscrew Placement in Class I Subjects <i>Nagham Mohammed Abdullah, Rohaya Megat Abdul Wahab, Mohamed Ibrahim Abu Hassan</i>	14
Detail Reproduction of Elastomeric Materials: Effect of Viscosity and Groove Geometry <i>Nik Zarina Nik Mahmood, Noor Hayaty Abu Kasim, Mamat Azuddin, Noor Lide Abu Kassim</i>	21
Muscular Pain Among Dentists- A Pilot Study <i>Faezah Sabirin, Siti Sarah Abdul Ahmad, W. Zahira Akmal W. Kamarudin</i>	32
Detection of Metabolomic Profile of Saliva In Healthy Malaysian Adults <i>Han Hing Lee, Lee Chee Yen, Yoshinobu Shoji, Chin Hoe The</i>	40

CASE REPORT

Blending The Appearance Of All-Ceramic Crowns In Fluorosis Condition With Direct Chair-Side Technique <i>Siti Mariam Ab Ghani, Ahmad Syahir Ahmad Zu Saifudin, Muhammad Aliff Ikram Noor Zari, Teh Adilla Mustaza</i>	47
---	----

LETTER TO EDITOR

Adopting Law School Pedagogy Into Teaching and Learning of Dentistry- my Melbourne Experience <i>Mas Suryalis Ahmad</i>	52
---	----

SUBMISSION GUIDELINES	55
------------------------------	----

Original Article

Muscular Pain Among Dentists- A Pilot Study

Faezah Sabirin^{*1}, Siti Sarah Abdul Ahmad¹, W. Zahira Akmal W. Kamarudin¹

¹ Centre of Preclinical Science Studies, Faculty of Dentistry, University Technology MARA Sg. Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Malaysia.

Abstract

Background: Muscular pain is the most common symptom associated to muscular skeletal disorders (MSDs). Dentists were exposed to ergonomic hazards while treating the patients. Without proper dental ergonomics, they are predisposed to the MSDs. **Objective:** This present study was designed to analyse the prevalence of muscular pain among practising dentists in Universiti Teknologi MARA (UiTM) and its relatedness to ergonomic factors. **Methodology:** A total of 25 dentists were participated in this pilot study. The inclusion criteria include working experience of at least six months and those who were readily diagnosed with musculoskeletal disorders were excluded. A self-administered questionnaire was employed to gather demographic informations and close ended ("yes" or "no") questions were asked to assess the muscular pain experienced in the last 12 months. The collected data were then analysed statistically. **Result:** The result showed a 100% response rate. 92% of the respondents were reported to experience muscular pain, particularly on the upper body parts. Only maintenance of same postures without microbreaks and performing torsions or cervical flexions to improve vision of oral cavity correlate significantly ($P < 0.05$) to the presence of muscular pain that respondent experienced. However, age, nature of work and high working hours per week does not correlate to the muscular pain. **Conclusion:** The prevalence of muscular pain among dentists in UiTM is high which indirectly suggested the lack of dental ergonomic awareness and practice in their routine at work.

Keywords: *Ergonomic, muscular pain, musculoskeletal disorders*

Introduction

The MSDs is defined as musculoskeletal discomfort, symptoms or pain sensation at certain areas of body such as the neck, shoulder, limbs and lower back of body (1). It is a commonly discussed issue among dentists. Conditions such as fractures, contusions, abrasions, and lacerations resulted from physical contact of extraneous objects to body surfaces are excluded from the context of MSDs (2). MSDs most commonly reported as

presence of muscular pain (OSHA 3). The pain sensation felt was resulted from injuries or disorders of muscles, nerves, tendons, joints, cartilage or structures that support the upper and lower limbs, neck and lower back (2). The severity of MSDs can be varied from mild to severe which was caused and/or exaggerated by sudden sharp turning or prolonged exposure to physical factors (3). Carpal Tunnel Syndrome is an example of MSDs associated with dental profession with the involvement of nerves, tendons and muscles (4).

The MSDs is not limited to the dentists. The same issue was also affecting the physicians and surgeons (5). However, the dentists were at higher risk for work-related MSDs (6). This

^{*}Corresponding to: Dr Faezah Sabirin, Center of Preclinical Science Studies, Faculty of Dentistry, University Technology MARA Sg. Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Malaysia.
Email: drfaezah@salam.uitm.edu.my
Tel: +603-61266603 Fax: +603-61266103

fact has drawn serious concern to many organizations including the National Institute for Occupational Safety and Health (2). Throughout the world, MSDs has been reported to affect two out of every three dentists at various degree of severity (7), which later contributed to their early retirements from service (8). It is believed that practicing good ergonomic at work place would offer preventive measure against this occupational health, thus the MSDs (2).

Dental ergonomics is the term used to describe ergonomic practice in dental profession (9). It covers many aspects from the correctness of various postures of dentist at work, positions of daily used dental equipments including the dental chair, arrangement and selection of equipments up to the scheduling of dental procedures between the hard or long cases with the simple or short ones (7). However, workplace is only one factor whilst the risk factors of MSDs are multifactorial. Posture at work seem to play a big role as the discomfort or pain sensed was mainly attributed by prolonged non-neutral work postures and high static muscle activity besides repetitive or stressful motions of hand and wrist (Abduljabbar, 2008 (10)). In reality, although dentists always strived to maintain a neutral and balanced posture, they often end-up in awkward postures. Gambhir et al., have reported that strained posture while working (both while standing and sitting close to a patient) would have put an extra burden on the spine and limbs thus resulted in negative effects on the musculoskeletal and peripheral nervous systems (11). The pain perceived was possibly due to ischemic condition resulted from activities that exerted asymmetrical forces applied on the spinal column (12).

In the bigger picture, the risk factors of MSDs include the personal factors, equipment and environment at work place (13, 14). In a daily routine work of a dentist for an instance, dental procedures always involved and required repetitive motions of the fingers and wrists as well as prolonged awkward postures in a limited working area (14, 15). On top of that, routine dental procedures such as cavity preparations, restorations, scaling and extractions demanded for precise motor skills with intense hand-eye coordination (14). Any one of the said factors is a known risk factor for MSDs. Besides, working in the same posture for long hours during dental procedures is another important factor (10). Although there are reports on the prevalence of MSDs among dentists worldwide, there are limited data addressing dentists in Asia thus in Malaysia. This pilot study was undertaken to find the prevalence of muscular pain among practising dentists in Universiti Teknologi MARA (UiTM) and it relatedness to ergonomic factors.

Materials and Methods

An informed consent form and questionnaire adapted from Kanteshwari et al. (2011) was distributed between January and February 2013 to practising dentists in UiTM. The data collected was based entirely on the perceptions and self-reports from the respondents. Their reports were based upon their routine practices, equipment configurations, posture and positioning profiles, medical histories, personal exercise habits, and musculoskeletal symptoms experienced if any. This questionnaire required about 5 minutes to be completed. The questionnaire consisted of self-administered section for demographic data and followed by closed-ended questions with "yes" or "no"

options for the rest of the questionnaire.

At least six months of clinical work experience was required to participate in this study. Presence of muscle pain is determined with any pain perceived in the past 12 months period. On the other hand, respondents who were readily diagnosed with MSDs and those aged more than 65-year-old was excluded from this research. The data collected were then analysed through descriptive and inferential statistics by using SPSS version 21. Association between the respondents attributes

were determined using Pearson chi-squared statistic. The P value was set at 0.05 with 95% confidence interval.

Results and Discussion

A total of 25 questionnaires were distributed among the dentists in UiTM Shah Alam with 100% response rate. The respondents were consisted of 7 male and 18 female dentists with 84% of them are specialists. Age distribution and clinical working hours per week for all the respondents were displayed in figure 1 and figure 2 respectively.

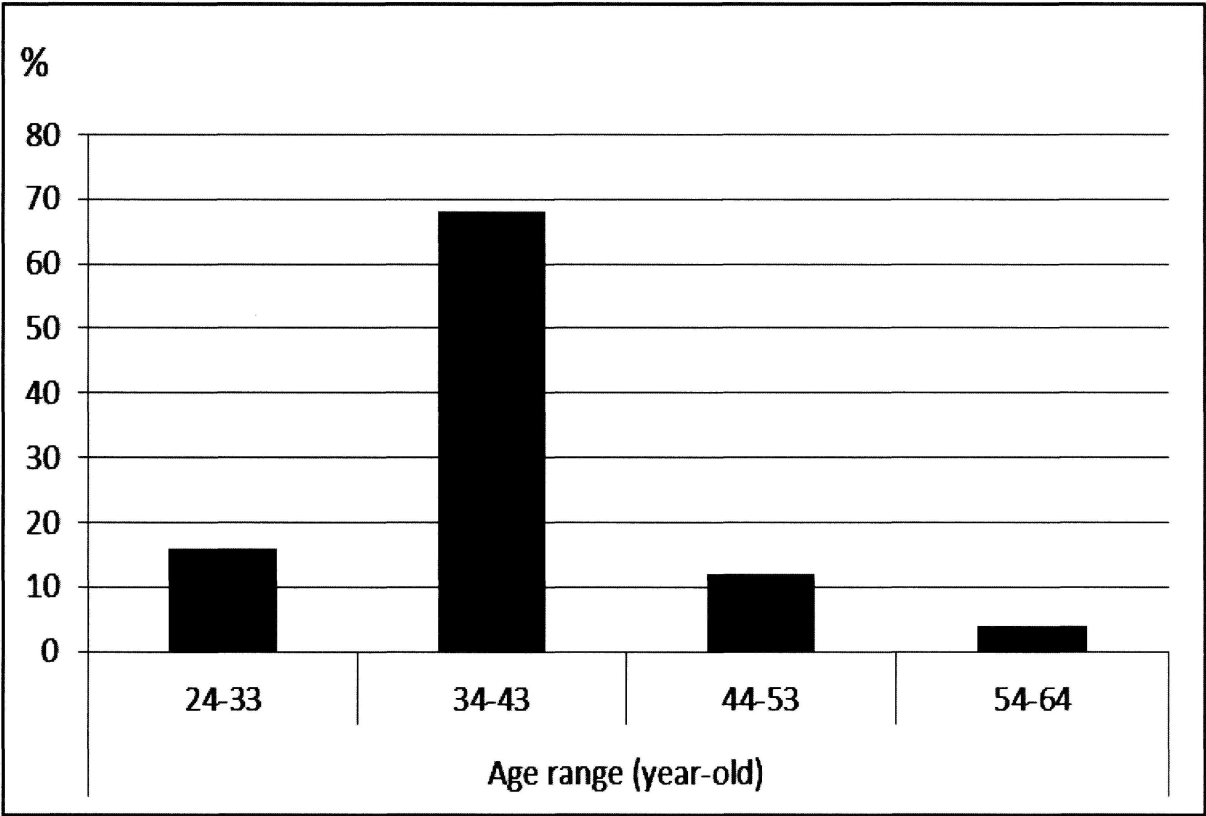


Figure 1: Distribution of age range among dentist in UiTM (n=25)

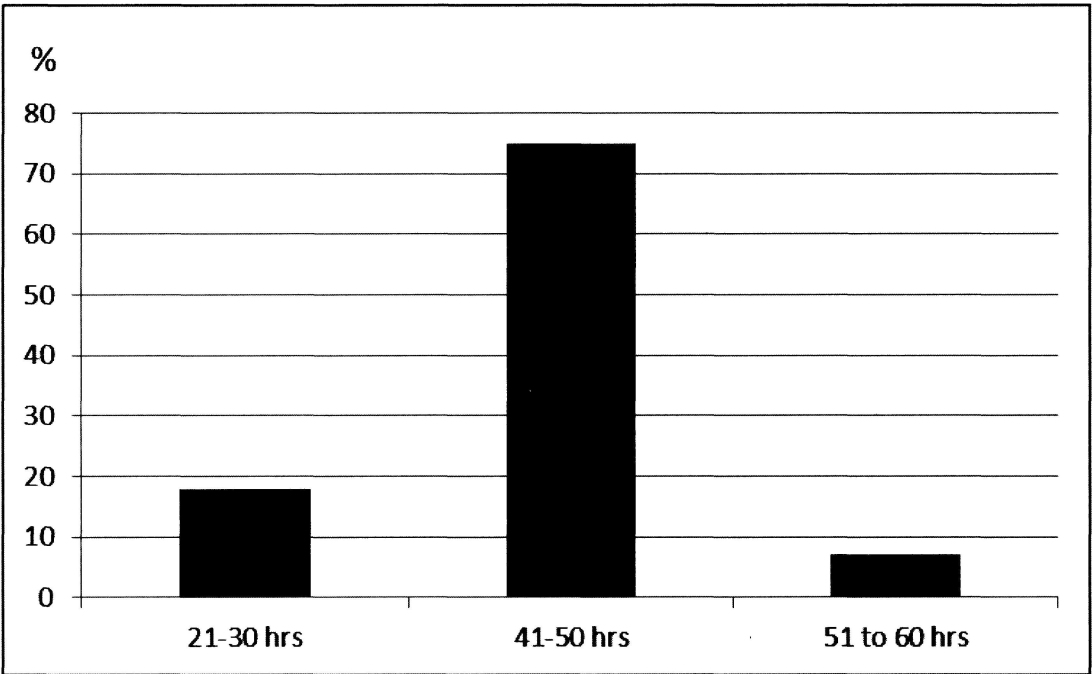


Figure 2: Working hours in clinic per week among dentist in UiTM (n=25)

Ninety two percent of the respondents were reported to experience muscular pain on various areas. Figure 3 shows the prevalence of muscular pain based on the areas of body they perceived. The remaining 8% of the

respondents were muscular pain-free and claimed to practise several dental ergonomic in daily work. The dental ergonomic they practised is listed in table 1.

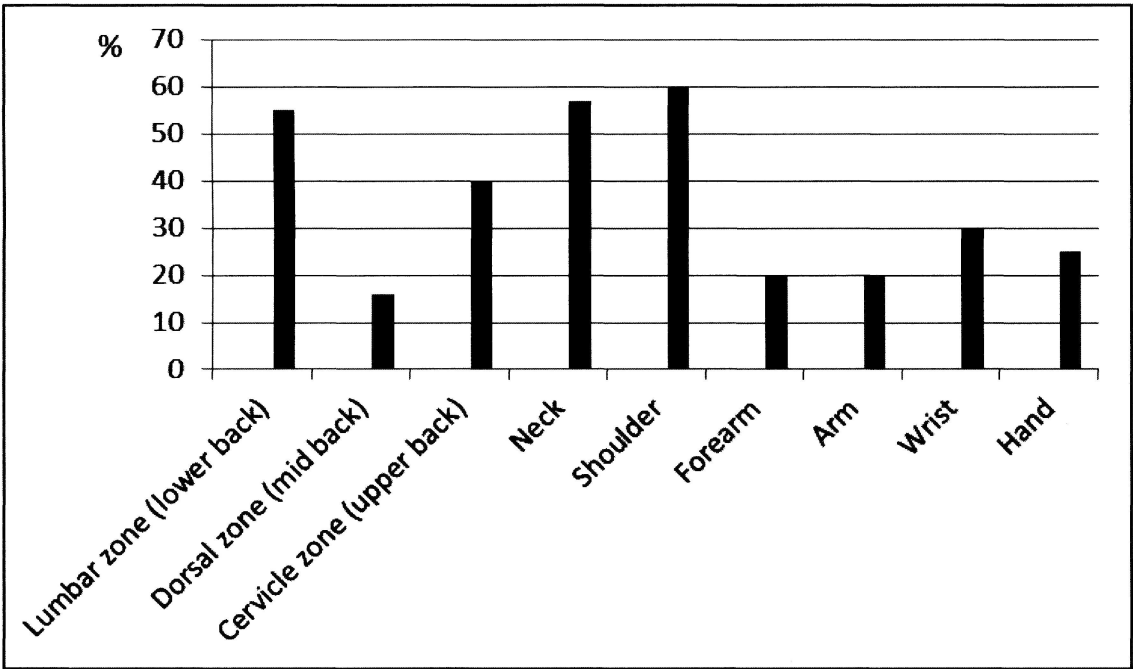


Figure 3: Musculoskeletal pain among dentists in UiTM based on its location

Dental ergonomic practices of muscular pain-free respondents
Sufficient light at workplace
Instruments are placed within easy reach
Work instruments are in optimal conditions so no need to do extra work
Position the chair to maintain an ergonomic posture
Adjust the chair so that your thighs are parallel to the floor
Adjust the patient's chair when accessing different quadrants
The instruments placed within hand reach without making strenuous movements
Aware that the dental stool used in the clinical practice can be ergonomically regulated for the individual needs
Work stool is comfortable
Use hand instruments with larger-diameter handles
Use a surgical magnification system when necessary

Table 1: List of correct ergonomic practices among muscular pain-free dentists in UiTM

Some of common doings of respondents that caused muscular pain were identified. The actions of maintenance of same postures without microbreaks and performing torsions or cervical flexions to improve vision while working in oral cavity were significantly ($P<0.05$) correlate to the muscular pain they experienced.

Discussion

This research examined the prevalence and distribution of muscular pain among dentist in UiTM. The result showed high prevalence (92%)of muscular pain among the respondents. The result was in agreement with Dayakar et al. (2013) who reported a slightly higher prevalence of 93.9% (16). On the other hand,

unlike other researches that reported highest prevalence of neck pain (2, 17), our result showed highest prevalence of shoulder pain and followed by neck pain. For comparison, Dayakar et al. (2013) reported highest prevalence of back pain and followed by neck pain and shoulder pain. The location of pain perceived by the denstists were believed to be sourced to their practice at work. Different way of setting and posture would resulted in pain at different area. Besides that, Gupta et al. (2013) reported similar pain pattern of occurance in all dental workers, not only in dentist but also in dental hygienist and dental assistants. In our study, the highest prevalence of shoulder pain may be contributed by handling of small instruments during treating patients which required awkward arm and shoulder positions

to reach specific regions within the mouth. The action would have put inevitably increased load on the shoulder which later resulted in the pain (17). In general, the high prevalence of muscular pain was very worrying as it contributed to the development of MSDs in the future (18). For a comparison, computer workers, who have a similar sedentary working posture, have been found to have a comparable prevalence of 65.7% with highest prevalence of neck pain (19). Both professions seemed to involve sitting postures at work. Interestingly, the high prevalence of muscular pain may be due to lack of awareness on ergonomics at work (14) and therefore translated in poor ergonomic practice. In the same view, NIOSH have addressed the issue and outlined the prevention of MSDs among dentists is through dental ergonomics.

Gupta et al. (2013) highlighted that the aim of ergonomic is to find the best fit between workers and their working conditions. Since MSDs are multifactorial, association between some known factors were tested. Based on the analysis of our results, there was no association between age, nature of work and working hours to muscular pain. Feng et al. (2014) however found that age factor did contributed to muscular pain in which the older the individual, the higher the prevalence of muscular/skeletal symptoms. On another note, the results of this study revealed that only maintenance of same postures without microbreaks and performing torsions or cervical flexions to improve vision of the oral cavity during dental procedures significantly ($P<0.05$) associated to muscular pain in the dentists. Prolonged posture without microbreaks with no ergonomic intervention and with times, may caused pathologies such as

tendinitis, synovitis, tenosynovitis, and bursitis (14). It is well known that dental procedures do require adequate vision exposure for a good visual of the targetted tooth structures which often forced the dentists to be in awkward and static postures for a period of time (NIOSH). Such occupational hazard however caused muscular pain that may progress to MSDs, in which can lead to long-term disability (20). It was interesting that respondents who claimed were free from muscular pain, do practiced dental ergonomic. Their practices however, were limited to selection and positioning of dental instruments at workplace (table 1). Nevertheless, it seemed adequate to prevent muscular pain. Possibly, the ergonomic practiced did ease the static loading of the neck and hinders awkward positions of the hands which were some of the suggested dental ergonomic put forwarded by NIOSH as prophylaxis to muscular pain and therefore MSDs. Efforts to increase the attention and awareness of MSDs in individuals within dental profession was therefore appropriate (18).

Conclusion

Dentists are more vulnerable to occupational health hazards due to the need of the dental profession itself compared to other health care giver. Among many, MSDs represented a major occupational health issues for dentists worldwide and reports have revealed the necessary need to create awareness of ergonomics as effective measures for reducing MSDs among dentists. In conclusion, the high prevalence of muscular pain among dentist in UiTM indirectly reflected the lack of dental ergonomic awareness. The maintenance of static posture and performing torsions or

cervical flexions to improve vision seemed to be the contributing factor to the muscular pain among the respondents. Since it was well described in literatures on how poor ergonomics at work resulted in MSDs and prevention through the implementation of dental ergonomic worked, awareness among dentist perhaps should be promoted.

References

1. Karahan A, Kav S, Abbasoglu A, Dogan N (2009) Low back pain: Prevalence and associated risk factors among hospital staff. *J Adv Nurs*. **65**, 516–24
2. National Institute for Occupational Safety and Health (NIOSH), Centre of Disease Control and Prevention (CDC)
3. OSHA: Occupational Safety & Health Administration, U.S. Dept. of Labor. Ergonomics Program, final rule, **Federal Register** **65**:68261-68870 (2000)
4. American Dental Association, Ergonomics For Dental Students, 2011
5. Rambabu T and Suneetha K (2014) Prevalence of Work Related Musculoskeletal Disorders Among Physicians, Surgeons and Dentists: A Comparative Study. *Ann Med Health Sci Res*. **4**(4), 578–582
6. Puriene A, Aleksejuniene J, Petrauskiene J, Balciuniene I, Janulyte V (2008) Self-reported occupational health issue among Lithuanian dentists. *Int Health* **46**, 369-374
7. Hokwerda O, Wouters JAJ, Ruijter RAJ and Zijlstra-Shaw S (2007) Ergonomic requirements for dental equipment: guidelines and recommendations for designing, constructing and selecting dental equipment. European Society of Dental Ergonomic
8. Thornton LJ, Stuart-Buttle C, Wyszynski TC, Wilson ER (2003) Physical and psychosocial stress exposures in US dental schools: the need for expanded ergonomics training. *Appl Ergon*. **35**(2), 153-157
9. Gupta A, Ankola AV and Hebbal M (2013) Dental ergonomics to combat musculoskeletal disorders: a review. *International Journal of Occupational Safety and Ergonomics* **19**(4), 561–571
10. Abduljabbar TA (2008) Musculoskeletal disorders among dentists in Saudi Arabia. *Pakistan Oral & Dental Journal* **28**(1), 135-144
11. Gambhir RS, Singh G, Sharma S, Brar R and Kakar H (1973) Ergonomics in the Dental Surgery. *Occupational Medicine* **23**, 128-131
12. Sarkar PA and Shigli AL (2011) Ergonomics in General Dental Practice. *People's Journal of Scientific Research* **5**(1), 56-60
13. Rucker LM and Sunell S (2002) Ergonomic Risk Factors associated with clinical dentistry. *Journal of the California Dental Association* **30**(2), 139-148
14. Kanteshwari K, Sridhar R, Mishra AK, Shirahatti R, Maru R and Bhusari P (2011) Correlation of awareness and practice of working postures with prevalence of musculoskeletal disorders among dental professionals. *General Dentistry* **59**(6), 476-483
15. Alexopoulos EC, Stathi I-C and Charizani F (2004) Prevalence of musculoskeletal disorders in dentists. *BMC Musculoskeletal Disorders*. **5**, 16
16. Dayakar MM, Gupta S, Philip G and Pai P (2013) Prevalence of musculoskeletal disorder among dental practitioners. *ASL Musculoskeletal Diseases* **1**(1), 22-25
17. Feng B, Liang Q, Wang Y, Andesen LL and Szeto G (2014) Prevalence of work related

musculoskeletal symptoms of the neck and upper extremity among dentists in China.

BMJ Open 4, e006451

18.Desai V, Pratik P and Sharma R (2012)

Ergonomics: A Must for Dentistry: a cross-sectional study in various parts of Northern India. **Journal of Dentofacial Science 1(2)**, 1-5

19.Kaliniene G, Ustinaviciene R, Skemiene L, et al. (2013) Associations between neck

musculoskeletal complaints and work related factors among public service computer workers in Kaunas. **Int J Occup Med Environ Health 26**, 670–681

20.Nutalapati R., Gaddipati R., Chitta H., Pininti M. and Boyapati R (2009) Ergonomics in Dentistry and the Prevention of Musculoskeletal Disorders in Dentist. **The Internet Journal of Occupational Health 1(1)**

SUBMISSION GUIDELINES

Mission and Scope:

Compendium of Oral Science (Compend.Oral.Sci), is the official journal of the Faculty of Dentistry, Universiti Teknologi MARA (UiTM). The goal of Compendium of Oral Science is to publish peer-reviewed, hypothesis-driven, original research articles on a broad range of topics of general interest to those working on the oral science and dentistry. The journal welcomes submissions in a wide array of subspecialties from throughout the world in achieving this goal.

Types of Articles Published

Authors are invited to submit manuscripts for publication as Regular articles (full-length research reports), short communications, case reports, Reviews and Letters to Editors.

Regular Articles: These should describe new and carefully confirmed findings, and experimental procedures should be given in sufficient detail for others to verify the work. The length of a full paper should be the minimum required to describe and interpret the work clearly.

Short Communications: Short communications should aim at being **no longer than two printed pages**. They should contain important, new, definitive information of sufficient significance to warrant publication. Short communications need not follow the usual division into Material and Methods etc. but should have a short Abstract.

Case Reports: Illustrating unusual and clinically relevant observations are acceptable but their merit needs to provide high priority for publication in the Journal. On rare occasions, completed cases displaying non-obvious solutions to significant clinical challenges will be considered. Short papers not exceeding 1200 words, a maximum of three illustrations (with consideration to certain case reports) and five references may be accepted for publication if they serve to promote communication between clinicians and researchers.

The main text of **case reports** should be organized with Introduction, case report, discussion and conclusion.

A paper submitted as a brief clinical / case report should include the following:

- A short **introduction** (avoid lengthy reviews of literature);
- The **case report** itself (a brief description of the patient/s, presenting condition, any special investigations and outcomes);

Discussion which should highlight specific aspects of the case(s), explain/interpret the main findings and provide a scientific appraisal of any previously reported work (if any) in the field. Interpretation of their significance and to draw a **Conclusions** or generalizations about future cases when warranted by the evidence presented, or suggestion for further possible studies.

Reviews: Submissions of reviews covering topics of current interest are welcome and encouraged. Reviews should be concise and no longer than 4-6 printed pages (about 12 to 18 manuscript pages). Reviews are also peer-reviewed.

Letters to the Editor: Letters to the Editor regarding published articles should be received within 2 months of mailing of the journal, letters regarding profession related matters will also be considered. Authors are encouraged to keep letters concise and succinct, with a limit of no more than 750 words. Introduction of new data will not be permitted. Each letter will be submitted to the author of the original paper so that any reply may be published simultaneously with the letter. Letters should have a descriptive title.

Frequency: One issue a year

Manuscript Submission Process

Before submitting your manuscript to **Compendium of Oral Science (Compend.Oral.Sci)**, authors should be familiar with the Editorial Policies. These describe our requirements regarding human and animal research, materials and methods disclosure, and prior publication. Information regarding the expectations of reviewers and editors and the review process are also available on this page.

Letter of Transmittal

This letter must be supplied during submission. The signatures of the corresponding author is required. The letter must have following:

- **Manuscript Title:** The Author(s) name(s) (identify the corresponding author, with complete address, telephone, FAX, and e-mail information).(50 word maximum)
- **Type of Manuscript:** Regular Article, Short Communication, Case Report, Review and Letter to the Editor.
- **Brief Statement of Significance:** A statement that describes the significance of the paper.
- **Statement of Direct Participation:** statement that declares that all of the authors have directly participated in the planning, execution, or analysis of the study and resulting paper, and have read and approved the version submitted.
- **Information:** Must include information on prior or duplicate publication or submission elsewhere of any part of the work/study; and a statement of financial or other relationships that might lead to a conflict of interest. *Copies of any permission(s) to reproduce published material, and to use illustrations or report information about identifiable people must accompany the manuscript.*
- **Optional-** The contact information of any suggested reviewers (names, addresses, and e-mail).

Manuscripts submitted without a letter of transmittal will not be processed for peer review.

Licence to Publish

The corresponding author will be contacted to complete the "Compendium of Oral Science: License to Publish form" upon an editorial decision of Accept.

Upon acceptance of a paper, authors are required to assign the exclusive licence to publish their paper to the Compendium of Oral Science. Assignment of copyright is a condition of publication, and papers will not be passed to the publisher for production unless copyright has been assigned. A completed Copyright Transfer Agreement must be sent to the address specified on the agreement, before any manuscript can be published. Authors may send the completed original Copyright Transfer Agreement by fax (optional) but must be followed by mail upon receiving notice of manuscript acceptance. Do not send the Copyright Transfer Agreement at submission.

Copyright

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, or thesis) that it is not under consideration for publication elsewhere; that if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher.

Authorship

All persons designated as authors should qualify for authorship. The entitlement to authorship should be based on all of the following criteria: (1) substantial contributions to conceptions and design, execution or analysis and interpretation of data; (2) drafting the article or revising it for important intellectual content; (3) final approval of the version to be published. *Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.* All contributors who do not meet the criteria for authorship should be listed in the Acknowledgements. *The order of authorship should be a joint decision of the co-authors.* Each author should have participated sufficiently in the work to take public responsibility for part of the content or the whole. Corresponding author must agree that above has been confirmed by all authors when submitting a manuscript.

Originality

By submitting your manuscript to the journal it is understood that this it is an original manuscript and is unpublished work and is not under consideration elsewhere.

Conflict of Interest

The Compendium of Oral Science's policy requires that each author reveal any financial interests or connections, direct or indirect, or other situations that might raise the question of bias in the work reported or the conclusions, implications, or opinions stated including pertinent commercial or other sources of funding for the individual author(s) or for the associated department(s) or organization(s), personal relationships, or direct academic competition.

As an integral part of the submission process, Corresponding authors are required to confirm whether they or their co-authors have any conflicts of interest to declare, and to provide details of these.

Any changes made to the list of conflicts after the paper is accepted must be submitted in writing, signed by the appropriate authors (that is, the corresponding author and the author for whom the conflict exists), to the *Com-*

pendium of Oral Science Editorial Office. Publication of manuscripts will be withheld until all such written approvals are received. *Compendium of Oral Science* accepts no responsibility for such changes.

Experimental Ethics:

- **Animal experiments:** When reporting animal experiments authors should indicate whether the institution's, national research council's, or any other law on the care and use of laboratory animals was followed.
- **Human subjects:** When reporting on human subjects, authors should indicate whether the procedures followed were in accordance with the ethical standards of the Helsinki Declaration (1964, amended most recently in 2008) of the World Medical Association. Manuscripts should include a statement that the patient's written consent was obtained and any information, including illustrations, should be as anonymized as far as possible. Authors should indicate that the design of the work has been approved by local ethical committees or that it conforms to standards currently applied in the country of origin. The name of the authorizing body should be stated in the paper.

Clinical Trials

Authors should indicate that the design of clinical trial study has been approved by local ethical committees / appropriate authority or that it conforms to standards currently applied in the country of origin. The name of the authorizing body should be stated in the paper. The clinical trial registration number and name of the trial register will then be published with the paper.

Funding

All sources of funding should be declared in the Acknowledgements. If a private/commercial sponsor supported the research, authors are advised to describe the role of the study sponsor (s), if any, in study design; in the collection, analysis, and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication. If the funding source had no such involvement, this should be stated.

Details of all funding sources for the work in question should be given in a separate section entitled 'Funding'. This should appear before the 'Acknowledgements' section.

The following rules should be followed:

- The sentence should begin: 'This work was supported by ...'
- The full official funding agency name should be given, i.e. 'National Institutes of Health', not 'NIH' (Grant numbers should be given in brackets as follows: '[grant number xxxx]')
- Multiple grant numbers should be separated by a comma as follows: '[grant numbers xxxx, yyyy]'
- Agencies should be separated by a semi-colon (plus 'and' before the last funding agency)
- Where individuals need to be specified for certain sources of funding the following text should be added after the relevant agency or grant number 'to [author initials]'

An example is given here: 'This work was supported by the National Institutes of Health [AA123456 to C.S., BB765432 to M.H.]; and the Alcohol & Education Research Council [hfygr667789].'

Evaluation of manuscripts

Submitted manuscripts are subject to peer review and are expected to meet standards of academic excellence. Peer-reviewers identities will remain anonymous to the authors. The Editor-in-Chief's decision regarding publication is based on the recommendation of the reports of reviewers, which will, at the Editors' discretion, be transmitted to the authors.

Authors may suggest the names and addresses of a few potential reviewers. The Editors and Associate Editors will be guided but not necessarily bound by these suggestions.

Form and Style of Manuscript

Manuscripts must be written in English. Manuscript documents should be formatted as follows:

- They should be typed on A4 form (21×29.7 cm or 21.6×28 cm)
- Double spaced
- 2.5 cm (1 inch) margins
- Justify
- Page numbers at the bottom of each page; centered or right-justified
- **11-point font;** restrict fonts to **Arial** throughout the manuscript (Use of other fonts is not recommended and could result in problems with converting your manuscript for review.)

- Avoid boldface, underlining, or italics in the manuscript

Other formatting notes:

- We do not publish Appendices.
- Do not embed figures into the manuscript. They must be uploaded as separate files for each figure. Separate pages should be used for the following: **(1) title page (s), (2) abstract, (3) text, (4) footnote(s) to the text, (5) references, (6) table(s), (7) legend(s) to figure(s), (8) declaration of Funding and Conflict of Interest**. The manuscripts should be arranged in the order indicated above and all pages should be numbered in succession except the figure(s), **the title page being page 1**.

Indicate the appropriate location in the text of the tables, figures, and other subsidiary materials by marginal notes. Latin words should be italicized (for example: *in vitro*, *i.e.*, *etc.*, *per se*). Footnote(s) to the author's name (s) and affiliation(s) should appear on the title page. All footnotes should be numbered in succession with superscript, Arabic numerals, starting from the title page footnote(s). Footnotes to tables should be identified with superscript lower case (a, b, etc.), and placed at the bottom of the table. Acknowledgement (if any) should appear after the main text, and before the References. It is advised that authors note any conflict of interest in this section.

Organization of Manuscript

A desirable plan for the organization of a **Regular Paper** is as follows: **(1) TITLE (2) ABSTRACT, (3) INTRODUCTION with no heading, (4) MATERIALS AND METHODS (5) RESULTS (6) DISCUSSION (7) REFERENCES**.

1. Title Page

Provide a title page, containing the following items.

- The type of paper
- Title. The title should be informative and as short as is consistent with clarity. The title should not include chemical formulae or arbitrary abbreviations, but chemical symbols may be used to indicate the structures of isotopically labeled compounds. The numbering of parts in a series of papers is not permitted, but titles and subtitles may be used if necessary.
- Next-line. List full names of all authors. A footnote reference(s) to an author(s), indicating a change of address, should be given on the title-page.
- Next-line. List the institution(s) in which the work was carried out, and the Zip Code / post code, if available.
- Running title. Provide a short running title of less than 50 strokes. It should be as informative as possible.
- The name, complete mailing address, telephone number, Fax number, and E mail address of the person to whom correspondence should be sent. To expedite the review, much of the journal's correspondence will be by E mail.
- Abbreviations. Non-standard abbreviations should be defined, even if they are known to those familiar with the field. List all non-standard abbreviations used in the paper in alphabetical order in a footnote on the title page.

Customary abbreviations in wide use need not be defined in text (e.g., RNA, ATP). Define other abbreviations the first time that they are used. Refer to the Journal of Biological Chemistry for recommended abbreviations for biological compounds, Chemical Abstracts for names of chemical compounds, Conn's Biological Stains (10th Edition, RW Horobin and JA Kiernan (eds.), BIOS Scientific Publishers) for nomenclature, and the CSE Style Manual (2006, 7th ed., Council of Science Editors) for scientific abbreviations. Use SI units only. The Journal does not print the degree symbol before temperature symbols. All temperatures are printed as follows: 80C, 37.4F, 276K.

2. Abstract

- The Abstract should **not exceeding 250 words**. Abstract text should be divided into the following sections: **Objectives** (a brief statement of the purpose of the investigation along with the the working hypothesis)- **Materials and Methods** (A brief description of the materials and experimental method used); **Results** (state the results simply and clearly so that significant facts can be readily identified, where appropriate, statistics should be clearly stated); **Conclusions** (a brief summary of the essential results you believe were demonstrated by the experimental data and the impact of the results). Abstract should be in a form comprehensible to any scientist and suitable for publication without the full article text.

Avoid statements such as "The significance of these results is discussed" that do not help the reader. The abstract should be intelligible to the non-specialist as well as the specialist in your field, and hence should avoid

specialized terms and abbreviations.

- ii) **Key words.** Provide 3-5 key words identifying the nature of the subject matter alphabetically in the last part of the summary.

3. Introduction

The main part of an article should start with a brief Introduction, which outlines the historical or logical origins of the study and clearly states the aim of the study and/or hypothesis to be tested, without repeating the abstract or summarizing the results. Avoid giving an extensive review of the literature.

4. Materials and Methods

The materials and methods section should provide a sufficient detailed description of the methods to allow a researcher to reproduce your work. Companies from which materials were obtained should be listed with their location: city and state, province or country.

The **Experimental Procedures** or **Materials and Methods** should give sufficient details to enable the reader to repeat your work exactly, if necessary. **The necessity for conciseness should not lead to omission of important experimental details.** Refer to previously published procedures employed by citation of both the original description and pertinent published modifications, and do not include extensive description unless they present substantially new modifications.

This section should present clearly but succinctly the experimental findings. Only results essential to establish the main points of the work should be included. Numerical data should be analyzed using appropriate statistical tests.

For guidelines on how to report statistical results, see Bailar, JC, Mosteller, F (1988) Guidelines for statistical reporting in articles for medical journals. *Ann Intern Med*, 108:266-273; Curran-Everitt, D, Benos DJ, (2004) Guidelines for reporting statistics in journals published by the American Physiological Society. *J Neurophysiol*, 92:669-671; Lang, TA, Secic, M (2006) How to report statistics in medicine: annotated guidelines for authors, editors and reviewers, 2nd edition, Philadelphia, PA, ACP Press; Sarter M, Fritschy JM (2008) *Eur J Neurosci* 28:2363-2364. compact presentation.

Experimental animals: When experimental animals are used, specify **species, strain, sex, age, supplier, and numbers of animals** used in total and for individual experimental conditions. The species should be identified in the Title or Abstract.

Statistical methods: A complete description of statistical methods is required.

Permissions

If all or parts of previously published illustrations are used, permission must be obtained from the copyright holder concerned. It is the author's responsibility to obtain these in writing and provide copies to the publishers.

5. Results and Statistical Analyses

The observations should be presented with minimal reference to earlier literature or to possible interpretations. The main statistical results should be reported in the Results section. The description of the statistical results should include the proper statistical term (such as the F statistic) as well as the degrees of freedom and the

P value. The description of statistical results in the figure legends should be limited to important post hoc comparisons.

Statistical methods should be described with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible, findings should be quantified and appropriate measures of error or uncertainty (such as confidence intervals) given. Details about eligibility criteria for subjects, randomization and the number of observations should be included. The computer software and the statistical method(s) used should be specified with references to standard works when possible

6. Discussion

The discussion section presents the interpretation of the findings, this is the only proper section for subjective comments. The discussion section should be as concise as possible and should include a brief statement of the principal findings while avoiding repetition of statements provided in the Abstract or the Results section.

A discussion of the validity of the observations, a discussion of the findings in light of other published work dealing with the same or closely related subjects, and a statement of the possible significance of the work. Extensive discussion of the literature is discouraged.

7. References

Only published and "in press" (i.e., accepted for publication in a specific journal or book) references should appear in the reference list at the end of the paper. The latest information on "in press" references should be provided. Any "in press" references that are relevant for reviewers to see in order to make a well-informed evaluation should be included as a separate document text file along with the submitted manuscript.

References cited in the text should be numbered in parentheses with Arabic numerals in order of appearance. Be sure to verify the wording of any personal communication with the person who supplied the information and get his approval for the use of his name in connection with the quoted information. All references should be listed in numerical order typed double-spaced on a separate sheet under the heading REFERENCES.

Please note the following examples.

(1) **For a journal article:**

7. Sanger F, Nicklen S, and Coulson AR (1977) DNA sequencing with chain-terminating inhibitors. **Proc. Natl. Acad. Sci. USA** **74**, 5463–5467

(2) **For a chapter in an edited book:**

12. Messing J (1983) New M13 vectors for cloning in **Methods in Enzymology** (Wu, R., Grossman, L., and Moldave, K., eds.) Vol. 101, pp. 20–51, Academic Press, New York

(3) **For a book by one or more authors:**

15. Sambrook J, Fritsch EF, and Maniatis T (1989) **Molecular Cloning. A Laboratory Manual** pp. 1339–1341, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY

Text citations to references written by more than two authors should be styled for example as, Smith et al. In the reference list, however, the names of all authors (with initials) must be given. If an article has been accepted for publication by a journal but has not yet appeared in print, the reference should be styled as follows:

29. Tanahashi H and Ito T (1994) Molecular characterization of a novel factor recognizing the interleukin-6 responsive element. **J. Biochem. (in press)**

References should be cited in the text as follows: "The procedure used has been described elsewhere (Green, 1978)," or "Our observations are in agreement with those of Brown and Black (1979) and of White et al.

(1980)," or with multiple references, in chronological order: "Earlier reports (Brown and Black, 1979, 1981; White et al., 1980; Smith, 1982, 1984).... "

The use of "in preparation" and "submitted for publication" is not allowed in the reference list.

Citation of the references written in a language which is usually unreadable for general readers and those published in a journal (or book) to which general reader could not easily access should be avoided.

8. Figure Legends:

Figure legends must be placed after the Literature Cited section. Manuscript document files lacking figure legends will not be reviewed. Do not duplicate material from the text or described in the methods in your figure legends. Indicate scale bar size if it is not indicated on the figure. Figure legends should be prepared for each figure. There should be sufficient experimental detail in the legend to make the figure intelligible without reference to the text (unless the same material has been given with a previous figure, or in the Experimental Procedures section).

- **Tables:** Tables should be self-explanatory and should not duplicate textual material. Each table must be appended to the end of the manuscript, after the Figure Legends, in either Word or Excel table format. **DO NOT** embed photographs or image files of tables. Legends or keys must accompany each table and should not be added to the Figure Legends. Tables should be numbered consecutively using Arabic numerals, and should include a brief title. Use footnotes (superscripted lower-case letters) to explain abbreviations, statistics, etc. Place explanatory matter in footnotes, not in the heading.
- **Figures:** Figures must be first cited in the manuscript in ascending numeric order. Subsequent references need not be in order, but the first citation of a figure must occur after preceding figures and before following figures (eg. Figure 2 cannot be referenced until after Figure 1 has been). Figures can be first referenced in groups or in the same figure reference (eg. Figure 1-3 or Figure 5 and 6).

9. Abbreviations

Abbreviations should be kept to an absolute minimum. Abbreviations save relatively little space but greatly diminish the readability of a manuscript. In general, abbreviations should not appear in the Abstract, and sentences that contain more than one abbreviation merit careful review. The word must always be written out in full when first used and the proposed abbreviation given in parentheses. A list of all abbreviations used in the text and their meanings must be provided (in alphabetic order).

10. Acknowledgements

A short statement about grant and other financial support should be given, along with a list of contributions from collaborators who are not co-authors (it is implicit that they agree with this mention), and a declaration of competing interests. See above under Editorial Policies for additional items to be addressed in the Acknowledgements.

11. Short Communications:

A Short Communication is suitable for recording the results of complete small investigations or giving details of new models or hypotheses, innovative methods, techniques or apparatus. The style of main sections need not conform to that of full-length papers. Short communications are 2 printed pages (about 6 manuscript pages) in length.

The word limit is 1500 words and up to 10 references, and an abstract of not more than 120 words.

E-mail Confirmation of Submission

After submission you will receive an e-mail to confirm receipt of your manuscript. If you do not receive the confirmation e-mail after three (3) working days, please check your e-mail address carefully in the system. If the e-mail address is correct please contact the editorial office.

Proofs:

Proofs (Electronic proofs) will be sent through e-mail attachment to the corresponding author by PDF wherever possible and should be returned within three (3) working days of receipt through e-mail. Corrections should be restricted to typesetting errors; any other amendments made may be charged to the author. Any queries should be answered in full. Therefore, it is important to ensure that all of your corrections are returned to us in one all-inclusive e-mail or fax. Subsequent additional corrections will not be possible, so please ensure that your first communication is complete.

Sending a Revised Manuscript

While submitting a revised manuscript, corresponding author is requested to include, along with single copy of the final revised manuscript, a scanned copy of the revised manuscript with the changes underlined in **red** and with the point to point clarification to each comment. The manuscript number should be written on each of these documents.

Reprints:

Information for ordering reprints can be obtained from the editorial office.

Manuscript Submission

All materials send to email: kazi@salam.uitm.edu.my

[Manuscript along with the "Letter of Transmittal" signed by the corresponding author (scanned copy)].

Editorial Address

Kazi Ahsan Jamil, BDS, PhD

Editor-in-Chief,

Compendium of Oral Science (Compend.Oral.Sci),

Faculty of Dentistry

UiTM Sungai Buloh Campus

Jalan Hospital,

47000 Sungai Buloh,

Selangor, Malaysia.

Tel: +603-6126 6511

Fax: +603-6126 6103

E-mail: kazi@salam.uitm.edu.my